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EXAMINER
DOLE, TIMOTHY J

ART UNIT	PAPER NUMBER
2858	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/057,752	SIGLINGER ET AL.	
	Examiner	Art Unit	
	Timothy J. Dole	2858	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-58 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-58 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Objections

1. Claims 17-22 are objected to because of the following informalities: Claim 17 recites the limitations "the tone signal" on page 18, line 22 and "the known signal" on page 19, line 12. Claim 18 recites the limitation "the known signal" on page 19, line 21. There is insufficient antecedent basis for these limitations in the claims. Also, the words "to the" are left out of the ninth line of claim 17, which should read "an amplifier connected to the probe antenna and noise ...". Finally, "method" should be "apparatus" in the first line of claim 18. Claims 19-22 are objected to for depending on objected independent claim 17. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 28-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Tolman.

Referring to claim 28, Tolman discloses a method for detecting a desired signal in an electromagnetically noisy environment, the method comprising: detecting electromagnetic signals comprising a noise signal and the desired signal (column 3, lines 63-66); filtering the detected electromagnetic signals to generate a filtered signal comprising substantially the desired signal (column 4, lines 18-27); and expanding the

filtered signal (column 4, lines 27-31). It should be noted that the probe is detecting signals in a telephone cable conductor pair in which a signal is flowing. Therefore since the signal flowing in the conductor would produce electric and magnetic fields, the detected signal is considered to be an electromagnetic signal.

Referring to claim 29, Tolman discloses the method as claimed wherein the desired signal is a known signal (column 1, lines 14-19).

Referring to claim 30, Tolman discloses the method as claimed wherein the desired signal is a signal on a metallic conductor (column 1, lines 9-10).

4. Claims 33, 40 and 41 are rejected under 35 U.S.C. 102(b) as being anticipated by Spies.

Referring to claim 33, Spies discloses a method for detecting a desired signal in an electromagnetically noisy environment, the method comprising: detecting with a first antenna electromagnetic signals comprising a noise signal and the desired signal (column 2, line 66 – column 3, line 24); detecting with a second antenna electromagnetic signals comprising substantially the noise signal (column 4, lines 16-24); and inverting the noise signal detected by the second antenna (column 5, lines 28-34), and summing the inverted signal to the signal detected by the first antenna to generate a summed signal (column 5, lines 22-28). It should be noted that since the canceling antenna is wound in the same direction as the conductor winding, the signals would be summed together.

Referring to claim 40, Spies discloses the method as claimed wherein the desired signal is a known signal (column 3, lines 19-24).

Referring to claim 41, Spies discloses the method as claimed wherein the desired signal is a signal on a metallic conductor (column 1, lines 26-30). It should be noted that

the desired signal is detected from geophysical formations, which have some metallic conductive properties.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-3, 5, 6, 8-10, 13, 14, 23-25, 42-44, 46, 47, 49-51 and 54-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tolman in view of Brown, Jr.

Referring to claim 1, Tolman discloses a method for detecting a desired signal in an electromagnetically noisy environment, the method comprising: detecting electromagnetic signals comprising a noise signal and the desired signal (column 3, lines 63-66); filtering the signal to generate a filtered signal comprising substantially the desired signal (column 4, lines 18-27); and expanding the filtered signal (column 4, lines 27-31). It should be noted that the probe is detecting signals in a telephone cable conductor pair in which a signal is flowing. Therefore since the signal flowing in the conductor would produce electric and magnetic fields, the detected signal is considered to be an electromagnetic signal.

Tolman does not disclose compressing the detected electromagnetic signals to generate a compressed signal.

Brown, Jr. discloses a method for detecting a signal comprising: compressing the detected signals to generate a compressed signal (column 4, lines 51-54).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the compressing step of Brown, Jr. into the method of Tolman for the purpose of compressing the signal whereby reducing error due to noise and improving the intelligibility of the signal (column 1, lines 11-14).

Referring to claim 2, Tolman discloses the method as claimed wherein the desired signal is a known signal (column 1, lines 14-19).

Referring to claim 3, Tolman discloses the method as claimed wherein the desired signal is a signal on a metallic conductor (column 1, lines 9-10).

Referring to claim 5, Tolman discloses the method as claimed except for the step of amplifying the compressed signal.

Brown, Jr. discloses the step of amplifying the compressed signal (column 3, lines 46-47).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the step of amplifying the compressed signal of Brown, Jr. into the method of Tolman for the purpose of making sure the compressed signal is output at the correct level whereby increasing the effectiveness of the system (46-56).

Referring to claim 6, Tolman discloses the method as claimed, further comprising the step of generating an audible sound indicative of the expanded signal (column 3, lines 16-24).

Referring to claim 8, Tolman discloses an apparatus for detecting a desired signal in electromagnetically noisy environments, the apparatus comprising: an antenna (fig. 2 (73)) configured to detect electromagnetic signals comprising a noise signal and the

desired signal; a bandpass filter (fig. 1 (31)) for generating a filtered signal comprising substantially the desired signal; and an electronic signal expandor (fig. 1 (43)) connected to the bandpass filter and configured for expanding the filtered signal.

Tolman does not disclose an electronic signal compressor electrically connected to the antenna and configured for compressing the electromagnetic signals to thereby generate a compressed signal.

Brown, Jr. discloses an electronic signal compressor (fig. 4 (52)) electrically connected to the antenna and configured for compressing the electromagnetic signals to thereby generate a compressed signal.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the compressor of Brown, Jr. into the apparatus of Tolman for the same purpose as given in claim 1, above.

Referring to claim 9, Tolman discloses the apparatus as claimed wherein the desired signal is a known signal (column 1, lines 14-19).

Referring to claim 10, Tolman discloses the apparatus as claimed wherein the desired signal is a signal on a metallic conductor (column 1, lines 9-10).

Referring to claim 13, Tolman discloses the apparatus as claimed except for a gain controller configured for adjusting amplitude of the compressed signal.

Brown, Jr. discloses a gain controller configured for adjusting amplitude of the compressed signal (column 3, lines 46-56).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the gain controller of Brown, Jr. into the apparatus of Tolman for the same purpose as given in claim 5, above.

Referring to claim 14, Tolman discloses the apparatus as claimed, further comprising an amplifier (fig. 1 (E)) and speaker (fig. 1 (65)) connected to the expandor (fig. 1 (43)) for generating an audible sound indicative of the expanded signal.

Referring to claim 23, Tolman discloses a method for detecting a desired signal in an electromagnetically noisy environment, the method comprising: detecting electromagnetic signals comprising a noise signal and the desired signal (column 3, lines 63-66) and filtering the compressed signal to generate a filtered signal comprising substantially the desired signal (column 4, lines 18-27).

Tolman does not disclose compressing the detected electromagnetic signals to generate a compressed signal.

Brown, Jr. discloses a method for detecting a signal comprising: compressing the detected signals to generate a compressed signal (column 4, lines 51-54).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the compressing step of Brown, Jr. into the method of Tolman for the same purpose as given in claim 1, above.

Referring to claim 24, Tolman discloses the method as claimed wherein the desired signal is a known signal (column 1, lines 14-19).

Referring to claim 25, Tolman discloses the method as claimed wherein the desired signal is a signal on a metallic conductor (column 1, lines 9-10).

Referring to claim 42, Tolman discloses a method for detecting a desired signal in an electromagnetically noisy environment, the method comprising: detecting electromagnetic analog signal comprising a noise signal and the desired signal (column 3, lines 63-66).

Tolman does not discloses converting the analog signal into a digital signal; compressing the digital signal using digital signal processing (DSP) to generate a compressed signal; filtering the compressed signal using DSP to generate a filtered signal comprising substantially the desired signal; expanding the filtered signal using DSP to generate an expanded digital signal; and converting the expanded digital signal to an analog signal.

Brown, Jr. discloses converting the analog signal into a digital signal (column 5, lines 44-47); compressing the summed signal using digital signal processing (DSP) to generate a compressed signal (column 3, lines 57-63); filtering the compressed signal using DSP to generate a filtered signal comprising substantially the desired signal (column 5, lines 58-60); and expanding the filtered signal using DSP to generate an expanded digital signal (column 5, lines 17-23); and converting the expanded digital signal to an analog signal (column 6, lines 21-23). It should be noted that the DSP components as shown in fig. 5 could be used in the configuration of fig. 4, wherein the expander would also be included in the DSP before the signal is converted back to an analog signal to be output to the speaker.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the steps of digitally compressing, filtering and expanding of Brown, Jr. into the method of Tolman for the same purpose as given in claim 34, above.

Referring to claim 43, Tolman discloses the method as claimed wherein the desired signal is a known signal (column 1, lines 14-19).

Referring to claim 44, Tolman discloses the method as claimed wherein the desired signal is a signal on a metallic conductor (column 1, lines 9-10).

Referring to claim 46, Tolman discloses the method as claimed except for the step of amplifying the compressed signal.

Brown, Jr. discloses the step of amplifying the compressed signal (column 3, lines 46-47).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the step of amplifying the compressed signal of Brown, Jr. into the method of Tolman for the same purpose as given in claim 5, above.

Referring to claim 47, Tolman discloses the method as claimed, further comprising the step of generating an audible sound indicative of the expanded signal (column 3, lines 16-24).

Referring to claim 49, Tolman discloses a method for detecting a desired signal in an electromagnetically noisy environment, the method comprising: detecting electromagnetic analog signal comprising a noise signal and the desired signal (column 3, lines 63-66).

Tolman does not discloses converting the analog signal into a digital signal; compressing the digital signal using digital signal processing (DSP) to generate a compressed signal; and filtering the compressed signal using DSP to generate a filtered signal comprising substantially the desired signal.

Brown, Jr. discloses converting the analog signal into a digital signal (column 5, lines 44-47); compressing the summed signal using digital signal processing (DSP) to generate a compressed signal (column 3, lines 57-63); and filtering the compressed signal using DSP to generate a filtered signal comprising substantially the desired signal (column 5, lines 58-60). It should be noted that the DSP components as shown in fig. 5 could be used in the configuration of fig. 4.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the steps of digitally compressing and filtering of Brown, Jr. into the method of Tolman for the same purpose as given in claim 34, above.

Referring to claim 50, Tolman discloses the method as claimed wherein the desired signal is a known signal (column 1, lines 14-19).

Referring to claim 51, Tolman discloses the method as claimed wherein the desired signal is a signal on a metallic conductor (column 1, lines 9-10).

Referring to claim 54, Tolman discloses a method for detecting a desired signal in an electromagnetically noisy environment, the method comprising: detecting electromagnetic analog signal comprising a noise signal and the desired signal (column 3, lines 63-66).

Tolman does not discloses converting the analog signal into a digital signal; filtering the digital signal using digital signal processing (DSP) to generate a filtered signal comprising substantially the desired signal; and expanding the filtered signal using DSP.

Brown, Jr. discloses converting the analog signal into a digital signal (column 5, lines 44-47); filtering the digital signal using digital signal processing (DSP) to generate a filtered signal comprising substantially the desired signal (column 5, lines 58-60); and expanding the filtered signal using DSP. It should be noted that the DSP components as shown in fig. 5 could be used in the configuration of fig. 4, wherein the expander would also be included in the DSP before the signal is converted back to an analog signal to be output to the speaker.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the steps of digitally filtering and expanding of Brown, Jr. into the method of Tolman for the same purpose as given in claim 34, above.

Referring to claim 55, Tolman discloses the method as claimed wherein the desired signal is a known signal (column 1, lines 14-19).

Referring to claim 56, Tolman discloses the method as claimed wherein the desired signal is a signal on a metallic conductor (column 1, lines 9-10).

7. Claims 4, 11, 12, 26, 45, 52 and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tolman in view of Brown, Jr. as applied to claims 1, 8, 23, 42, 49 and 54 above, and further in view of Spies.

Referring to claim 4, Tolman as modified discloses the method as claimed wherein the step of detecting electromagnetic signals is performed by a first antenna (column 3, lines 63-64).

Tolman as modified does not disclose the method further comprises: detecting with a second antenna electromagnetic signals comprising substantially the noise signal; and inverting the noise signal detected by the second antenna, and summing the inverted signal to the signal detected by the first antenna for the step of compressing.

Spies discloses a method comprising: detecting with a second antenna electromagnetic signals comprising substantially the noise signal (column 4, lines 16-24); and inverting the noise signal detected by the second antenna (column 5, lines 28-34), and summing the inverted signal to the signal detected by the first antenna for the step of compressing (column 5, lines 22-28). It should be noted that since the canceling antenna is wound in the same direction as the conductor winding, the signals would be summed together.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the second antenna of Spies into the method of Tolman as modified for the purpose of specifically detecting the noise near the detecting antenna, whereby allowing the noise to be canceled and the detected signal to be more accurate (column 2, lines 8-11).

Referring to claim 11, Tolman as modified discloses the apparatus as claimed except wherein the apparatus further comprises: a second antenna configured for detecting electromagnetic signals comprising substantially the noise signal; and an

amplifier connected to the compressor, first antenna, and second antenna, the amplifier being configured for inverting the signal detected by the second antenna, and summing the inverted signal to the signal detected by the first antenna.

Spies discloses a second antenna (fig. 1 (25)) configured for detecting electromagnetic signals comprising substantially the noise signal; and an amplifier (fig. 1 (29)) connected to the compressor, first antenna, and second antenna, the amplifier being configured for inverting the signal detected by the second antenna, and summing the inverted signal to the signal detected by the first antenna (column 5, lines 22-34).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the second antenna and amplifier of Spies into the apparatus of Tolman as modified for the same purpose as given in claim 4, above.

Referring to claim 12, Tolman discloses the apparatus as claimed except wherein the apparatus further comprises: a second antenna configured for detecting electromagnetic signals comprising substantially the noise signal; and a differential amplifier connected to the compressor, first antenna, and second antenna, the amplifier being configured for inverting the signal detected by the second antenna, and summing the inverted signal to the signal detected by the first antenna.

Spies discloses a second antenna (fig. 1 (25)) configured for detecting electromagnetic signals comprising substantially the noise signal; and a differential amplifier (fig. 1 (29)) connected to the compressor, first antenna, and second antenna, the amplifier being configured for inverting the signal detected by the second antenna, and summing the inverted signal to the signal detected by the first antenna (column 5, lines

22-34). It should be noted that the amplifier is considered to be a differential amplifier since it is stated in the abstract: "the amplifier provides the necessary amplification".

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the second antenna and differential amplifier of Spies into the apparatus of Tolman as modified for the same purpose as given in claim 4, above.

Referring to claim 26, Tolman as modified discloses the method as claimed wherein the step of detecting electromagnetic signals is performed by a first antenna (column 3, lines 63-64).

Tolman as modified does not disclose the method further comprises: detecting with a second antenna electromagnetic signals comprising substantially the noise signal; and inverting the noise signal detected by the second antenna, and summing the inverted signal to the signal detected by the first antenna for the step of compressing.

Spies discloses a method comprising: detecting with a second antenna electromagnetic signals comprising substantially the noise signal (column 4, lines 16-24); and inverting the noise signal detected by the second antenna (column 5, lines 28-34), and summing the inverted signal to the signal detected by the first antenna for the step of compressing (column 5, lines 22-28). It should be noted that since the canceling antenna is wound in the same direction as the conductor winding, the signals would be summed together.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the second antenna of Spies into the method of Tolman as modified for the same purpose as given in claim 4, above.

Referring to claim 45, Tolman as modified discloses the method as claimed wherein the step of detecting electromagnetic signals is performed by a first antenna (column 3, lines 63-64).

Tolman as modified does not disclose the method further comprises: detecting with a second antenna electromagnetic signals comprising substantially the noise signal; and inverting the noise signal detected by the second antenna, and summing the inverted signal to the signal detected by the first antenna for the step of compressing.

Spies discloses a method comprising: detecting with a second antenna electromagnetic signals comprising substantially the noise signal (column 4, lines 16-24); and inverting the noise signal detected by the second antenna (column 5, lines 28-34), and summing the inverted signal to the signal detected by the first antenna for the step of compressing (column 5, lines 22-28). It should be noted that since the canceling antenna is wound in the same direction as the conductor winding, the signals would be summed together.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the second antenna of Spies into the method of Tolman as modified for the same purpose as given in claim 4, above.

Referring to claim 52, Tolman as modified discloses the method as claimed wherein the step of detecting electromagnetic signals is performed by a first antenna (column 3, lines 63-64).

Tolman as modified does not disclose the method further comprises: detecting with a second antenna electromagnetic signals comprising substantially the noise signal;

and inverting the noise signal detected by the second antenna, and summing the inverted signal to the signal detected by the first antenna for the step of compressing.

Spies discloses a method comprising: detecting with a second antenna electromagnetic signals comprising substantially the noise signal (column 4, lines 16-24); and inverting the noise signal detected by the second antenna (column 5, lines 28-34), and summing the inverted signal to the signal detected by the first antenna for the step of compressing (column 5, lines 22-28). It should be noted that since the canceling antenna is wound in the same direction as the conductor winding, the signals would be summed together.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the second antenna of Spies into the method of Tolman as modified for the same purpose as given in claim 4, above.

Referring to claim 57, Tolman as modified discloses the method as claimed wherein the step of detecting electromagnetic signals is performed by a first antenna (column 3, lines 63-64).

Tolman as modified does not disclose the method further comprises: detecting with a second antenna electromagnetic signals comprising substantially the noise signal; and inverting the noise signal detected by the second antenna, and summing the inverted signal to the signal detected by the first antenna for the step of filtering.

Spies discloses a method comprising: detecting with a second antenna electromagnetic signals comprising substantially the noise signal (column 4, lines 16-24); and inverting the noise signal detected by the second antenna (column 5, lines 28-34),

and summing the inverted signal to the signal detected by the first antenna for the step of filtering (column 5, lines 22-28). It should be noted that since the canceling antenna is wound in the same direction as the conductor winding, the signals would be summed together.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the second antenna of Spies into the method of Tolman as modified for the same purpose as given in claim 4, above.

8. Claim 7, 16, 27, 48, 53 and 58 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tolman in view of Brown, Jr. as applied to claims 1, 8, 23, 42, 49 and 54 above, and further in view of Fricke et al.

Referring to claim 7, Tolman as modified discloses the method as claimed except wherein the method further comprises controlling whether the compressed signal is directed through the first filter or through a second filter connected in parallel with the first filter and expandor.

Fricke et al. discloses a method comprising controlling whether the compressed signal is directed through the first filter or through a second filter connected in parallel with the first filter and expandor (column 3, lines 20-24).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the filter controller of Fricke et al. into the method of Tolman as modified for the purpose of more accurately filtering heavy noise by allowing filtering at different frequencies (column 3, lines 24-27).

Referring to claim 16, Tolman as modified discloses the apparatus as claimed except wherein the apparatus further comprises: a second bandpass filter connected in parallel with the first bandpass filter and expandor; and means for controlling whether the compressed signal is directed through the first bandpass filter or the second bandpass filter.

Fricke et al. discloses a second bandpass filter (fig. 2 (53)) connected in parallel with the first bandpass filter and expandor; and means for controlling whether the compressed signal is directed through the first bandpass filter or the second bandpass filter (fig. 2 (43), (45), (47) and (49)). It should be noted that the first bandpass filter and expander of Tolman replace the first bandpass filter (51) of Fricke et al. It should also be noted that the filter circuits of Fricke et al. are bandpass filters (column 3, lines 29-33).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the second filter and control means of Fricke et al. into the method of Tolman as modified for the same purpose as given in claim 7, above.

Referring to claim 27, Tolman discloses the method as claimed except for controlling whether the compressed signal is directed through the first filter or through a second filter connected in parallel with the first filter.

Fricke et al. discloses controlling whether the compressed signal is directed through the first filter or through a second filter connected in parallel with the first filter (column 3, lines 20-24).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the filter controller of Fricke et al. into the method of Tolman as modified for the same purpose as given in claim 7, above.

Referring to claim 48, Tolman as modified discloses the method as claimed except wherein the method further comprises controlling whether the compressed signal is directed through the first filter or through a second filter connected in parallel with the first filter and expandor.

Fricke et al. discloses a method comprising controlling whether the compressed signal is directed through the first filter or through a second filter connected in parallel with the first filter and expandor (column 3, lines 20-24).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the filter controller of Fricke et al. into the method of Tolman as modified for the same purpose as given in claim 7, above.

Referring to claim 53, Tolman discloses the method as claimed except for controlling whether the compressed signal is directed through the first filter or through a second filter connected in parallel with the first filter.

Fricke et al. discloses controlling whether the compressed signal is directed through the first filter or through a second filter connected in parallel with the first filter (column 3, lines 20-24).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the filter controller of Fricke et al. into the method of Tolman as modified for the same purpose as given in claim 7, above.

Referring to claim 58, Tolman discloses the method as claimed except for controlling whether the compressed signal is directed through the first filter or through a second filter connected in parallel with the first filter.

Fricke et al. discloses controlling whether the compressed signal is directed through the first filter or through a second filter connected in parallel with the first filter (column 3, lines 20-24).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the filter controller of Fricke et al. into the method of Tolman as modified for the same purpose as given in claim 7, above.

9. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tolman in view of Brown, Jr. as applied to claim 8 above, and further in view of Stocklin.

Tolman as modified discloses the apparatus as claimed except for a tick generator connected to a speaker, the tick generator being configured for periodically generating a tick signal for output through the speaker to indicate that the apparatus is powered on and in a mode of operation.

Stocklin discloses a tick generator (fig. 2 (110)) connected to a speaker (fig. 2 (131)), the tick generator being configured for periodically generating a tick signal for output through the speaker to indicate that the apparatus is powered on and in a mode of operation (column 8, lines 27-30).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the tick generator of Stocklin into the apparatus of Tolman as

modified for the purpose of audibly indicating a mode of operation to a user whereby decreasing the chance for error due to a missed visual signal (column 8, lines 22-30).

10. Claims 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tolman and Spies in view of Brown, Jr.

Referring to claim 17, Tolman discloses an apparatus for detecting a signal in an electromagnetically noisy environment, the apparatus comprising: a probe antenna (fig. 2 (73)) configured to detect electromagnetic signals comprising a noise signal and the signal; a bandpass filter (fig. 1 (31)) for substantially filtering out the noise signal and outputting a filtered signal comprising substantially the signal and insubstantially the noise signal; an electronic signal expandor (fig. 1 (43)) connected to the bandpass filter and configured for receiving the filtered signal and generating an expanded signal comprising substantially the known signal amplifying and attenuating substantially the noise signal of the filtered signal; and a speaker (fig. 1 (65)) connected to the expandor for generating an audible sound indicative of the expanded signal.

Tolman does not disclose a noise canceling antenna configured for detecting electromagnetic signals comprising substantially the noise signal; an amplifier connected to the probe antenna and noise canceling antenna, the amplifier being configured for inverting the signal detected by the noise canceling antenna, and outputting an amplified signal comprising the sum of the inverted signal and the signal detected by the probe antenna; or an electronic signal compressor electrically connected to the amplifier for receiving the amplified signal, and configured for compressing the amplified signal to thereby generate a compressed signal.

Spies discloses a noise canceling antenna (fig. 1 (25)) configured for detecting electromagnetic signals comprising substantially the noise signal; an amplifier (fig. 1 (29)) connected to the probe antenna and noise canceling antenna, the amplifier being configured for inverting the signal detected by the noise canceling antenna, and outputting an amplified signal comprising the sum of the inverted signal and the signal detected by the probe antenna (column 5, lines 22-34).

Brown, Jr. discloses an electronic signal compressor (fig. 4 (52)) electrically connected to the amplifier for receiving the amplified signal, and configured for compressing the amplified signal to thereby generate a compressed signal.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the noise canceling antenna and amplifier of Spies and the compressor of Brown, Jr. into the apparatus of Tolman for the same purposes as given in claims 1 and 4, above.

Referring to claim 18, Tolman discloses the apparatus as claimed wherein the signal is a known signal on a wire (column 1, lines 14-19).

Referring to claim 19, Tolman discloses the apparatus as claimed except wherein the amplifier is a differential amplifier.

Spies discloses the amplifier is a differential amplifier (fig. 1 (29)). It should be noted that the amplifier is considered to be a differential amplifier since it is stated in the abstract: "the amplifier provides the necessary amplification".

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the differential amplifier of Spies into the apparatus of Tolman for the same purpose as given in claim 4, above.

Referring to claim 20, Tolman discloses the apparatus as claimed except for a gain controller interconnected between the compressor and bandpass filter and configured for adjusting the amplitude of the compressed signal.

Brown, Jr. discloses a gain controller interconnected between the compressor and bandpass filter and configured for adjusting the amplitude of the compressed signal (column 3, lines 46-56).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the gain controller of Brown, Jr. into the apparatus of Tolman for the same purpose as given in claim 5, above.

11. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tolman and Spies in view of Brown, Jr. as applied to claim 17 above, and further in view of Stocklin.

Tolman as modified discloses the apparatus as claimed except for a tick generator connected to a speaker, the tick generator being configured for periodically generating a tick signal, and the speaker being configured for making the tick signal audible to indicate that: the apparatus is powered on and operating in a mode of operation utilizing an expander.

Stocklin discloses a tick generator (fig. 2 (110)) connected to a speaker (fig. 2 (131)), the tick generator being configured for periodically generating a tick signal for

output through the speaker to indicate that the apparatus is powered on and in a mode of operation (column 8, lines 27-30).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the tick generator of Stocklin into the apparatus of Tolman as modified for the same purpose as given in claim 15, above.

12. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tolman and Spies in view of Brown, Jr. as applied to claim 17 above, and further in view of Fricke et al.

Tolman as modified discloses the apparatus as claimed except wherein the apparatus further comprises: a second bandpass filter connected in parallel with the first bandpass filter and expandor; and means for controlling whether the compressed signal is directed through the first bandpass filter or the second bandpass filter.

Fricke et al. discloses a second bandpass filter (fig. 2 (53)) connected in parallel with the first bandpass filter and expandor; and means for controlling whether the compressed signal is directed through the first bandpass filter or the second bandpass filter (fig. 2 (43), (45), (47) and (49)). It should be noted that the first bandpass filter and expander of Tolman replace the first bandpass filter (51) of Fricke et al. It should also be noted that the filter circuits of Fricke et al. are bandpass filters (column 3, lines 29-33).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the second filter and control means of Fricke et al. into the method of Tolman as modified for the same purpose as given in claim 7, above.

13. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tolman in view of Spies.

Tolman as modified discloses the method as claimed wherein the step of detecting electromagnetic signals is performed by a first antenna (column 3, lines 63-64).

Tolman as modified does not disclose the method further comprises: detecting with a second antenna electromagnetic signals comprising substantially the noise signal; and inverting the noise signal detected by the second antenna, and summing the inverted signal to the signal detected by the first antenna for the step of compressing.

Spies discloses a method comprising: detecting with a second antenna electromagnetic signals comprising substantially the noise signal (column 4, lines 16-24); and inverting the noise signal detected by the second antenna (column 5, lines 28-34), and summing the inverted signal to the signal detected by the first antenna for the step of compressing (column 5, lines 22-28). It should be noted that since the canceling antenna is wound in the same direction as the conductor winding, the signals would be summed together.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the second antenna of Spies into the method of Tolman as modified for the same purpose as given in claim 4, above.

14. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tolman in view of Fricke et al.

Tolman discloses the method as claimed except for controlling whether the compressed signal is directed through the first filter or through a second filter connected in parallel with the first filter.

Fricke et al. discloses controlling whether the compressed signal is directed through the first filter or through a second filter connected in parallel with the first filter (column 3, lines 20-24).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the filter controller of Fricke et al. into the method of Tolman as modified for the same purpose as given in claim 7, above.

15. Claims 34-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spies in view of Brown, Jr.

Referring to claim 34, Spies discloses the method as claimed except for compressing the summed signal to generate a compressed signal; filtering the compressed signal to generate a filtered signal comprising substantially the desired signal; and expanding the filtered signal.

Brown, Jr. discloses compressing the summed signal to generate a compressed signal (column 4, lines 51-54); filtering the compressed signal to generate a filtered signal comprising substantially the desired signal (column 4, lines 55-57); and expanding the filtered signal (column 5, lines 17-23).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the steps of compressing, filtering and expanding of Brown, Jr. into the method of Spies for the purpose of manipulating a signal to reducing error due to noise and improving the intelligibility of the signal (column 1, lines 11-35).

Referring to claim 35, Spies discloses the method as claimed except for filtering the summed signal to generate a filtered signal comprising substantially the desired signal and expanding the filtered signal.

Brown, Jr. discloses filtering the summed signal to generate a filtered signal comprising substantially the desired signal (column 4, lines 55-57); and expanding the filtered signal (column 5, lines 17-23).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the steps of filtering and expanding of Brown, Jr. into the method of Spies for the same purpose as given in claim 34, above.

Referring to claim 36, Spies discloses the method as claimed except for compressing the summed signal to generate a compressed signal and filtering the compressed signal to generate a filtered signal comprising substantially the desired signal.

Brown, Jr. discloses compressing the summed signal to generate a compressed signal (column 4, lines 51-54) and filtering the compressed signal to generate a filtered signal comprising substantially the desired signal (column 4, lines 55-57).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the steps of compressing and filtering of Brown, Jr. into the method of Spies for the same purpose as given in claim 34, above.

Referring to claim 37, Spies discloses the method as claimed except for compressing the summed signal using digital signal processing (DSP) to generate a

compressed signal; filtering the compressed signal using DSP to generate a filtered signal comprising substantially the desired signal; and expanding the filtered signal using DSP.

Brown, Jr. discloses compressing the summed signal using digital signal processing (DSP) to generate a compressed signal (column 3, lines 57-63); filtering the compressed signal using DSP to generate a filtered signal comprising substantially the desired signal (column 5, lines 58-60); and expanding the filtered signal using DSP (column 5, lines 17-23). It should be noted that the DSP components as shown in fig. 5 could be used in the configuration of fig. 4, wherein the expander would also be included in the DSP before the signal is converted back to an analog signal to be output to the speaker.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the steps of digitally compressing, filtering and expanding of Brown, Jr. into the method of Spies for the same purpose as given in claim 34, above.

Referring to claim 38, Spies discloses the method as claimed except for filtering the summed signal using digital signal processing (DSP) to generate a filtered signal comprising substantially the desired signal; and expanding the filtered signal using DSP.

Brown, Jr. discloses filtering the summed signal using digital signal processing (DSP) to generate a filtered signal comprising substantially the desired signal (column 5, lines 58-60); and expanding the filtered signal using DSP (column 5, lines 17-23). It should be noted that the DSP components as shown in fig. 5 could be used in the configuration of fig. 4, wherein the expander would also be included in the DSP before the signal is converted back to an analog signal to be output to the speaker.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the steps of digitally filtering and expanding of Brown, Jr. into the method of Spies for the same purpose as given in claim 34, above.

Referring to claim 39, Spies discloses the method as claimed except for compressing the summed signal using digital signal processing (DSP) to generate a compressed signal; and filtering the compressed signal using DSP to generate a filtered signal comprising substantially the desired signal.

Brown, Jr. discloses compressing the summed signal using digital signal processing (DSP) to generate a compressed signal (column 3, lines 57-63); and filtering the compressed signal using DSP to generate a filtered signal comprising substantially the desired signal (column 5, lines 58-60). It should be noted that the DSP components as shown in fig. 5 could be used in the configuration of fig. 4.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the steps of digitally compressing and filtering of Brown, Jr. into the method of Spies for the same purpose as given in claim 34, above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy J. Dole whose telephone number is 703-305-7396. The examiner can normally be reached on Mon. thru Fri. from 8:00 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, N. Le can be reached on 703-308-0750. The fax phone numbers for the organization

where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

TJD
March 25, 2003

N. Le
Supervisory Patent Examiner
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